Title (en)

Mould for thermal nanoimprint lithography, process for fabricating the same, and nanoimprint process using the same.

Title (de)

Form für die Lithographie durch thermische Nanoprägung, ihr Herstellungsverfahren und thermische Nanorprägung, bei der sie zum Einsatz kommt.

Title (fr)

Moule pour la lithographie par nanoimpression thermique, son procédé de préparation, et procédé de nanoimpression thermique le mettant en oeuvre

Publication

EP 2299324 B1 20180221 (FR)

Application

EP 10176641 A 20100914

Priority

FR 0956390 A 20090917

Abstract (en)

[origin: EP2299324A1] Heating mold for thermal nanoimprint lithography comprises: (a) a substrate (21) having a first principal surface and a second principal surface; (b) a thermally conducting layer (33); (c) an insulating layer (30) disposed beneath the thermally conducting mechanical support layer; (d) heating means (34) disposed on a second side of the second membrane in a zone of the second membrane above the second orifice; (e) an electrically and thermally insulating layer; (f) imprint patterns (37); and (g) means for supplying an electric current to the heating means. Heating mold for thermal nanoimprint lithography comprises: (a) a substrate having a first principal surface and a second principal surface, and a through-cavity extending from a first orifice in the first principal surface up to a second orifice in the second principal surface, the first principal surface being at least partially covered by a first membrane, and the second orifice being completely closed off by a second electrically and thermally insulating membrane with a first disposed in contact with the second principal surface and at least partially covering the second surface; (b) a thermally conducting layer that mechanically supports the second membrane on the first side of the second membrane above the second orifice; (c) an insulating layer disposed beneath the thermally conducting mechanical support layer; (d) heating means disposed on a second side of the second membrane in a zone of the second membrane above the second orifice; (e) an electrically and thermally insulating layer which covers the heating means and, at least partially, the second membrane; (f) imprint patterns disposed on the electrically and thermally insulating layer in a zone of the electrically and thermally insulating layer above the second orifice; and (g) means for supplying an electric current to the heating means. Independent claims are: (1) a process for producing mold comprising: (a) forming a thermally conducting and mechanical support layer in a zone of a first principal surface of a substrate; (b) depositing a first membrane on a second principal surface of the substrate; (c) depositing a second electrically and thermally insulating membrane on the first principal surface; (d) depositing an electrically resistive heating layer on a zone of the second membrane above the thermally conducting and mechanical support layer; (e) shaping the electrically resistive heating layer; (f) depositing an electrically and thermally insulating layer on the shaped, electrically resistive heating layer and onto the second membrane; (g) producing imprint patterns on the electrically and thermally insulating layer; (h) forming at least one lead for supplying electric current to the electrically resistive heating layer; and (i) etching the first membrane, then forming a cavity in the substrate from a first orifice in the second principal surface up to the thermally conducting mechanical support layer, in a zone of the first principal surface; and (2) a process for producing a substrate comprising a nanostructured surface by thermal nanoimprint lithography, where the mold is employed.

IPC 8 full level

G03F 7/00 (2006.01); **B29C 33/02** (2006.01)

CPC (source: EP US)

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